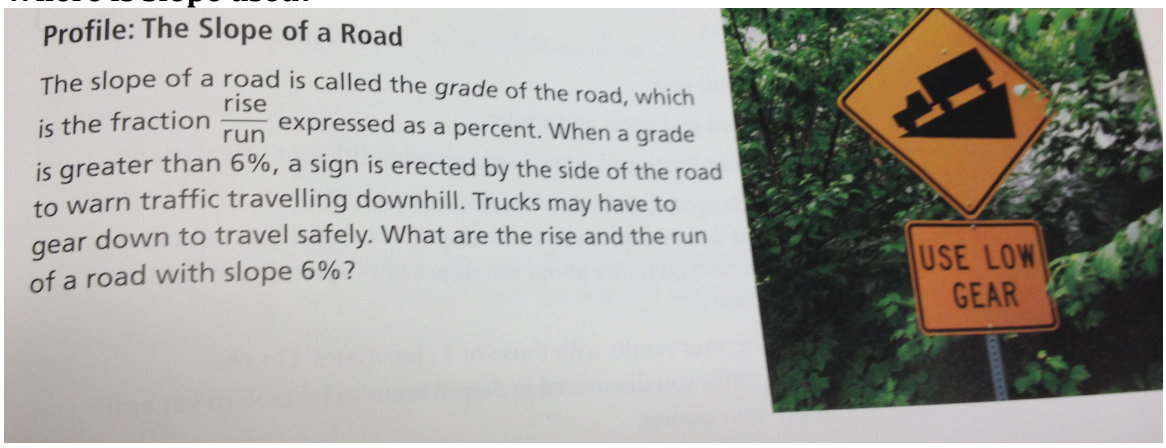
4.2 Slopes of Parallel and Perpendicular Line Segments

Where is Slope used?



- These road signs are an easy way to warn drivers that the next hill has a greater grade (slope as a percent) than 6% which is very slippery when icy.
    - To put in perspective: a paraplegic ramp usually has a grade of 8%.
- Everything has a slope-all roads, parking lots, sewers. Each different piece has a design minimum slope in percent.
- Example: parking lot has to be above 0.50% which is 5mm of drop over 1.0m run.

Recall: Find the slope between the points (5,4) and (-3,1)

Today's Objective: To use slope to find out if two lines are parallel of perpendicular
Q: What are <u>parallel lines</u>?

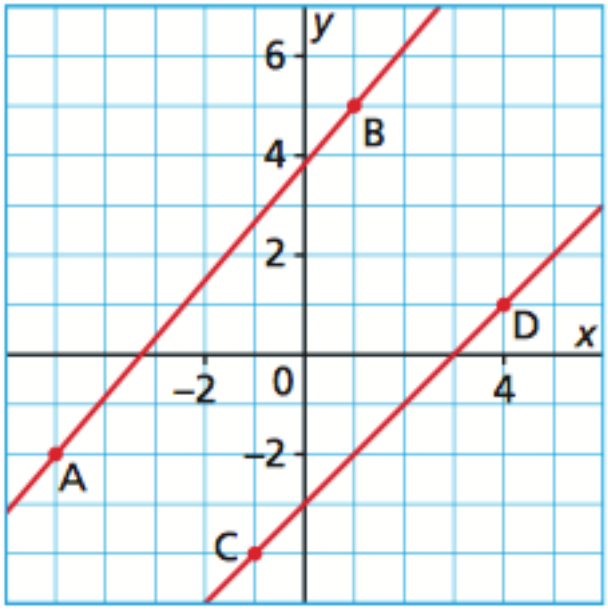
Q: How do the slopes of parallel lines compare to one another?

Fundamental Property of Parallel Lines:
1.

2.

Example 1: Line GH passes through G(-4,2) and H(2,-1) and line JK passes through J(1,-7) and K(7,3). Are they parallel? Justify the answer.

Example 2: Write the coordinates of the 2 labeled points on each line. Are the two lines parallel? Justify your answer.

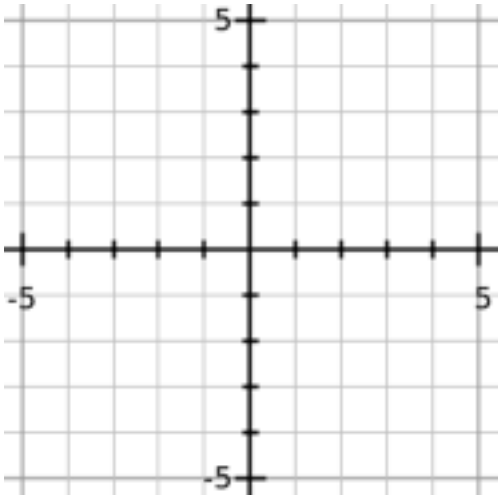


Q: What are <u>perpendicular lines</u>?

Example 3: Draw the line segment (-2,-1), (3,2).
Find the slope of this line segment.

Draw the line segment (-2,-1), (-5,4).
Find the slope of this line segment.

What do you notice about the two lines? What types of lines are these?



Fundamental Property of Perpendicular Lines:
1.

2.

Example 4: Determine the slope of a line that is perpendicular to the line through E(2,3) and F(-4, -1).

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1, 2, 3, 4, 5, 7, 8, 11